Listing of the Claims

1. (Currently Amended) A ~~Scintillation~~ Scintillation layer ~~(10, 20, 30)~~ for a PET-detector with a curved internal surface ~~(12, 22)~~ and/or a curved outer surface ~~(13, 23)~~, comprising a plurality of scintillation elements ~~(11, 21, 31a, 31b)~~ that are joined together with minimal gaps and that are oriented towards the centre of curvature ~~(14, 24, 34)~~ of the scintillation layer.

2. (Currently Amended) The ~~Scintillation~~ scintillation layer ~~(10)~~ according to claim 1, ~~characterized in that~~ wherein it is cylindrically curved and that it comprises scintillation elements ~~(11)~~ having the form of a truncated wedge.

3. (Currently Amended) The ~~Scintillation~~ scintillation layer ~~(20)~~ according to claim 1, ~~characterized in that~~ wherein it is curved in an ellipsoidal way and that it comprises scintillation elements ~~(21)~~ having the form of a truncated pyramid.

4. (Currently Amended) The ~~Scintillation~~ scintillation layer ~~(10, 20, 30)~~ according to claim 1, ~~characterized in that~~ wherein gaps between neighbouring scintillation elements ~~(11, 21, 31)~~ are filled with a reflecting material.

5. (Currently Amended) A PET-detector with a scintillation layer ~~(10, 20, 30),~~ the scintillation layer having a curved internal surface ~~(12, 22)~~ and/or a curved outer surface ~~(13, 23)~~ and comprising a plurality of scintillation elements ~~(11, 21, 31a, 31b)~~ that are joined together with minimal gaps and that are oriented towards the centre of curvature ~~(14, 24, 34)~~ of the scintillation layer.

6. (Currently Amended) The PET-detector according to claim 5, ~~characterized in that~~ wherein the scintillation layer ~~(10, 20, 30)~~ is designed according to ~~one of~~ claims ~~2 to 4~~.

7. (Currently Amended) ~~Procedure~~ A method for the production of a scintillation layer ~~(10, 20, 30)~~ for a PET-detector ~~by~~ comprising joining a plurality of scintillation elements ~~(11, 21, 31a, 31b)~~ with minimal gaps, the scintillation elements being shaped in such a way that the resulting scintillation layer ~~(10, 20, 30)~~ is curved and ~~that the~~orienting the scintillation elements ~~(11, 21, 31a, 31b) are oriented~~ towards the centre of curvature ~~(14, 24, 34)~~ of the scintillation layer.

8. (Currently Amended) ~~Procedure~~ The method according to claim 7, ~~characterized in that~~ wherein the resulting scintillation layer ~~(10, 20, 30)~~ is designed according to ~~one of~~ claims ~~2 to 4~~.

9. (Currently Amended) ~~Procedure~~The method according to claim 7, ~~characterized in that~~ wherein the scintillation elements ~~(11, 31a, 31b)~~ are cut from scintillation crystals.

10. (Currently Amended) ~~Procedure~~ The method according to claim 7, ~~characterized in that~~ wherein the scintillation elements ~~(21)~~ are produced by press-forming of ceramic scintillation materials.

11. (New) An imaging detector comprising:

a plurality of scintillation elements that are joined together to form a substantially gapless scintillation layer with a substantially continuous curved detection surface; and

one or more photodection elements that sense light photons generated by the scintillation elements.

12. (New) The imaging detector of claim 11, wherein the scintillation elements are comprised of GSO, LSO, LYSO, LuAG, $LaBr_3$ or a combination of any such materials.

13. (New) The imaging detector of claim 11, wherein each scintillation element as a depth and a width that varies with the depth.

14. (New) The imaging detector of claim 13, wherein the widths of each of the scintillation elements are substantially for any given scintillation element depth.

15. (New) The imaging detector of claim 11, wherein the scintillation layer includes a substantially continuous curved outer surface.